SURA

SOUTHEASTERN UNIVERSITIES
RESEARCH ASSOCIATION

1991 ANNUAL REPORT

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Southeastern Universities Research Association

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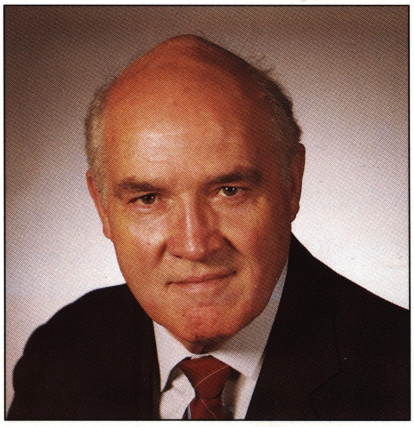
FOREWORD

In this first year of the second decade for SURA I am struck by the remarkable progress we have made as an organization and by the promise of the future.



Our flagship projects, CEBAF and SURAnet, are well established and highly respected by the groups they serve, by their peers, and by their sponsoring agencies.

CEBAF is far down the road to completion and to the start of its experimental program in early 1994 . Additional funds have been provided by the Congress for 1992 to help maintain the construction schedule, and recent DOE reviews have resulted in recognition and acceptance of the cost of completing and equipping CEBAF in timely fashion. CEBAF also is looking into the future with plans to utilize the unique technology and capabilities of its accelerator to develop advanced lasers for industrial applications and new scientific opportunities — an important contribution to technology transfer.

SURAnet continues to grow rapidly in numbers of institutions served and in the scope and quality of the service it renders to the scientific and educational communities. An important milestone was reached September 9 when I signed an agreement with MCI that will result in utilizing MCI facilities to improve the reliability of SURAnet and assure low costs for its members. SURAnet also is strengthening its efforts to bring the benefits of computer networking to the attention of more and more scientists and educators throughout the Southeast and to encourage and enhance their use of this technology.

Increased collaboration among our members, a prime object of SURA, is moving ahead in other areas: in materials research through the growing summer program at Oak Ridge, a precursor to a materials center; in high energy physics, including preparation for research at the Superconducting Super Collider; and in light sources through the SURA-sponsored Southeastern Photon Light Source Consortium.

While I had hoped for greater progress in support for global climate change research, I still believe that the excellent proposal we have submitted will bear fruit, once the federal government develops an interagency mechanism whereby large, unsolicited, interdisciplinary proposals can be fairly considered. There are signs that this might occur in the not too distant future.

An earlier survey indicated strong interest among SURA members in participating in collaborative, interdisciplinary global climate change research. We have planned workshops and development of proposals complementary to the first proposal, but these have been deferred pending the outcome of support for the first proposal.

Interest in new collaborative projects is continually being expressed, and I see such projects growing in number and significance for SURA in the years to come. The enthusiasm and breadth of interest in collaborative projects in our region is unique and a great source of strength for SURA — and for regional science and education. The efforts of the Long-Range Planning Committee to develop improved communications within SURA and effective methods and procedures for developing and supporting projects of excellence from such interests are an important step toward this larger future.

It is clear to me that SURA is increasingly making its mark in the region and in the world scientific community. I am confident that SURA will make an even larger impact in the years to come. Key to our achievements to date and our expectations for the future is the continued interest and strong involvement and contributions of our members and of their scientists and administrators in SURA projects and programs. Their ideas, leadership, enthusiasm, and persistence are the source of SURA's success.

William A. Wallenmeyer
President

SURA's Goals and Criteria for Projects

SURA's goals are to foster excellence in scientific research, to strengthen the scientific and technical capabilities of the nation and of the Southeast, and to provide outstanding training opportunities for the next generation of scientists and engineers.

PROJECTS CONSIDERED FOR SURA SPONSORSHIP MUST MEET THE FOLLOWING CRITERIA:

- High standards of scientific excellence;
- Contribute significantly to the nation's research capabilities and the advancement of science;
- Best be handled by a consortium, rather than a single institution;
- Strengthen the scientific stature of the participating institutions and benefit the Southeast;
- Draw on inspired, dedicated leadership by individual scientists, combined with effective science management.

Executive Summary

The past year marked the beginning of the second decade for the Southeastern Universities Research Association, an active and productive research organization well-known in the Southeast and the United States.

SURA's flagship projects, CEBAF and SURAnet, are well established and highly respected by the groups they serve, by their peers, and by their sponsoring agencies.

Recognizing the importance of building on the experience of SURA's first decade and looking forward to the next, the SURA Board of Trustees established in 1991 an ad hoc committee to consider long-range plans for SURA's development and future activities. The committee has been working throughout the year and will report to the Board at its November 1991 meeting.

SURA President William A. Wallenmeyer announced that he will retire next spring after serving in the post since October 1987. As a consequence, the Board appointed a committee to undertake a search for Wallenmeyer's successor.

With more than 60 percent of the construction completed and 75 percent of construction funds committed, the Continuous Electron Beam Accelerator Facility (CEBAF) is well on its way to becoming a scientific facility ready for use by the physics community in fiscal year 1994. The Experimental Equipment Laboratory was completed this year and now houses activities on various components of the large detectors being built for the experimental program.

Progress continued apace on the development, production, installation, and testing of the extensive scientific and technical equipment that will make the accelerator the premier research tool for the nuclear physics community.

The front end of the accelerator — the section that moves electrons from the injector into the beamline — is in place. At 11:30 p.m. on June 11, the CEBAF injector accelerated an electron beam to 45 MeV — the energy for which the front end was designed. Cryomodules, the basic unit of the accelerator, are being installed in the accelerator tunnel.

By this fall, major experimental equipment contracts had been placed for all three experimental end stations. Planning for the initial experimental program is completed with proposals approved for 8000 hours of beam time, half of that available during the first three years of operation. The uncommitted available beamtime will provide the flexibility needed to pursue new research proposals and ideas from the scientific users community.

CEBAF scientists have proposed that two advanced free electron lasers (FELs), using unique capabilities of the CEBAF accelerator, could be developed as a technology transfer project for industrial and scientific applications. An Industrial Advisory Board was formed by CEBAF and has met to advise on the potential scope and uses of the FELs.

Educational outreach and activities by CEBAF's staff have grown steadily more sophisticated this year. In particular, CEBAF piloted a new approach to motivating inner-city fifth- and sixth-grade students in science and math. The program is called BEAMS — for Becoming Enthusiastic About Math and Science.

In its fifth year, SURAnet is a fully operational regional computer network which continues to grow and to improve in service to the research and education communities of the Southeast. SURAnet now connects more than 120 southeastern sites to the NSFNET and the Internet.

SURAnet can offer its users comprehensive network services — both technical

and informational. Users benefit from alternate and redundant pathways to the NSFNET through nodal switching systems at the two Network Operations Centers in College Park, Md., and Atlanta, Ga., and a Federal Interagency Exchange, at College Park, connecting to five federal research agency networks.

In September, SURA signed an agreement with MCI that will provide a new technological configuration for the SURAnet backbone and will yield improved service, greater reliability, and lower costs for SURAnet members.

In March, a Network Information Center (NIC) was established to deliver information support to SURAnet sites and users in a variety of areas. The NIC pursues its goals through a quarterly newsletter, a published information resources guide, and training seminars. To facilitate network-based scientific collaboration and cooperation, the NIC is helping scientific groups to develop directories, data bases, and newsletters.

Key to SURA's achievements to date and expectations for the future is the continued interest and strong involvement and contributions of our members and of their scientists and administrators in SURA projects and programs.

A newly established and appointed SURA Review Committee for SURAnet, chaired by Vanderbilt University Chancellor Joe B. Wyatt, met in September to review and assess SURAnet. The review was favorable, and the committee gave the network high marks for its accomplishments.

SURA has continued to press for federal funding of its major, multiuniversity, interdisciplinary global change research proposal developed under the leadership of Ronald Pulliam, SURA Vice-President for Global Change Research and Director of the Institute of Ecology of the University of Georgia. A major obstacle has been the inability of the several federal agencies involved to get together for a fair and reasonable interagency review and support of a broad, unsolicited research program as proposed by SURA.

The SURA Council on Materials Science and Engineering, under the new leadership of William Sibley of the University of Alabama at Birmingham, is continuing the preparation of proposals for the materials science center concept. This year, SURA sponsored its third summer materials research program with the Oak Ridge National Laboratory. This was the first year of direct federal support — by the Department of Energy — and the program continues to demonstrate the effectiveness of collaboration among materials scientists and engineers throughout the Southeast.

SURA continues to serve as a facilitator in bringing together representatives of the photon light sources in the southeastern region to encourage collaboration and coordination of their plans and research efforts. A major step for the group this year was to formalize, with a charter, the existence of the Southeastern Photon Light Source Consortium and to set forth goals for cooperation, user support, and the development and application of advanced photon sources in the region.

SURA is advancing high energy physics in the region. SURA initiated and cosponsored a November 1990 SSC conference in Atlanta, to illuminate SSC scientific and industrial opportunities.

SURA also continues its involvement in and contribution to the work of the Southern Association for High Energy Physics (SAHEP), specifically the SAHEP Initiative for SSC Research and Education which has won funding support by the Texas National Research Laboratory Commission.

CEBAF

As 1992 approaches, it is abundantly evident that the Continuous Electron Beam Accelerator Facility (CEBAF) has established itself both as a national scientific research institution and a visible landmark in the City of Newport News and the greater Hampton Roads community in Virginia. With more than 60 percent of the construction completed and 75 percent of construction funds committed, CEBAF is well on its way to becoming a scientific facility ready for use by the physics community in fiscal year 1994.

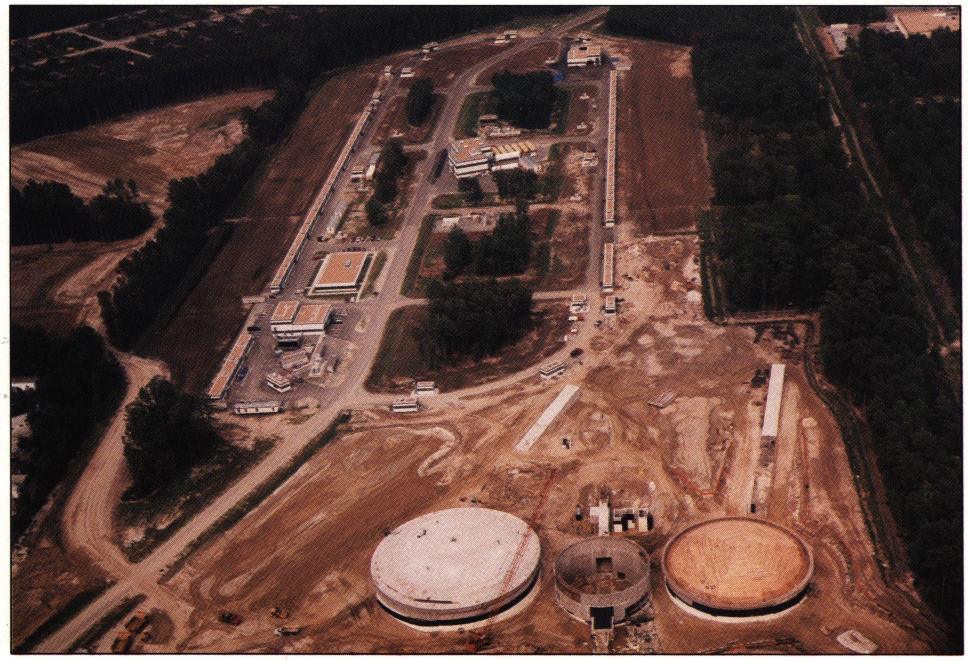
CONSTRUCTION WELL ALONG

The accelerator tunnel has been completed and covered with earth, and the beamline apparatus is being installed. The underground portion of the three domed, concrete end stations — the experimental halls — is nearing completion, and the halls will soon be covered with earth like the tunnel. Meanwhile, planning for the construction of aboveground appurtenances to the end stations, including a cooling tower, beam dump cooling buildings, exit stair buildings, the experimental equipment computer control room, and other service structures, is under way. All this civil construction will be completed by October 1992. Experimental Hall C will be ready for occupancy by January 1992.

Earlier in the past year, the Experimental Equipment Laboratory (EEL) — an imposing, two-story structure of corrugated steel — was completed. In full swing in the EEL are activities on various components for the large detectors that will occupy the end stations.

Similarly, progress has continued apace

Progress has continued apace at CEBAF in development, production, installation, and testing of the extensive scientific and technical equipment that will make the accelerator the premier research tool that SURA contracted with the Department of Energy to build for the nuclear physics community.



Great strides in conventional construction show in this aerial view. The accelerator tunnel and associated buildings are clearly visible, and in the foreground work continues on the three end stations. The current construction contract was completed in September, and by next year's annual report publication all that will show will be three earth mounds and several service buildings.

At 11:30 p.m. on June 11, the CEBAF injector's full two-and-a-quarter superconducting cryomodules accelerated an electron beam to 45 MeV — the energy for which the front end was designed.

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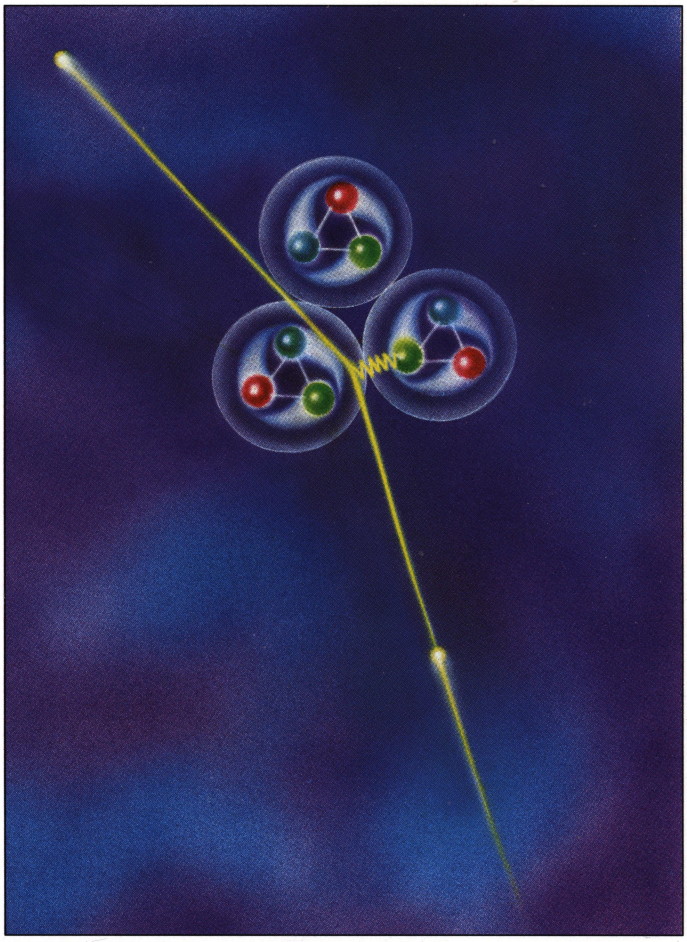
The front end of the accelerator — the section that moves the electrons from the injector into the beamline — is in place in the tunnel. On March 30, 1991, using the injector's initial quarter cryomodule, the beam was accelerated to an energy of 5 MeV (million electron volts). On April 25, with one-and-a-quarter cryomodules in place, the beam reached 25 MeV. Then, at 11:30 p.m. on June 11, the CEBAF injector's full two-and-a-quarter superconducting cryomodules accelerated an electron beam to 45 MeV — the energy for which the front end was designed.

The Central Helium Liquefier (the world's largest helium refrigeration plant at 2 degrees Kelvin) supplied the liquid helium that creates the very low superconducting temperatures needed for the successful front end tests. Meanwhile, work continues on fabrication and installation of transfer lines in the accelerator enclosure tunnel that will deliver the helium throughout the accelerator when it is complete.

Cryomodules, the basic unit of the accelerator, are being installed in the tunnel. Currently in place are the two and one-quarter cryomodules that make up the injector and the first cryomodule of the north linear accelerator. Installation of cryomodules continues as their assembly is completed in the test laboratory.

The dipole and quadrupole magnets that will guide and focus the electron beam around the arc sections of the racetrack shaped tunnel are being fabricated and tested for installation. Well along in the arc sections is installation of the 450 stands that will hold the magnets.

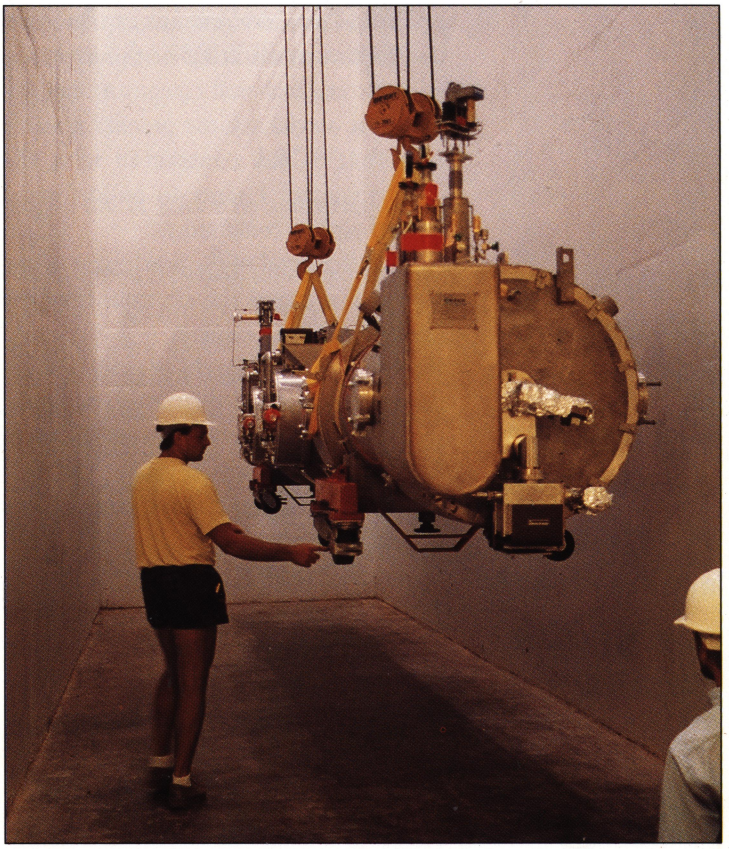


CEBAF will use a very powerful electron beam to probe the internal structure of the atom. This artist's concept of the CEBAF electron beam shows the interaction of the electron beam with the quarks in the protons and neutrons of the atom. As the electron passes close to a quark, a photon is emitted that transfers energy and momentum that excites existing quarks and/or generates new particles. These excitations and new particles are then detected and recorded by CEBAF's sophisticated spectrometers and other detectors. The results of these experiments will be studied to better understand quarks and the role they play in the nature of matter.

A $6.5 million contract has been awarded for fabrication of the toroidal magnet for the CLAS (CEBAF Large Acceptance Spectrometer) detector for

By fall 1991, major experimental equipment contracts had been placed for all three experimental halls.

Experimental Hall B. This detector is based on a magnetic field produced by six superconducting coils and will be used for detection of multiple-particle final states. Hall C will house a moderate-resolution, high-momentum spectrometer supplemented by other systems, including a short-orbit spectrometer for detecting decaying particles such as pions and kaons. Hall A will have a matched pair of high-resolution spectrometers for charged-particle coincidence studies. By fall 1991, major experimental equipment contracts had been placed for all three experimental halls.



CEBAF transported its third production cryomodule to the accelerator tunnel enclosure in June. Pictured is a 15 ton crane being used to lower the 27 foot long, 6 ton cryomodule 25 feet to the tunnel, where it was carefully pulled into its place in the tunnel. This cryomodule is named SURA.

Magnet stands continue to be installed in the east arc sections of the accelerator tunnel enclosure. The five levels of magnets shown in this arc are designed to accept each of the five energies that will travel through the linear accelerator.

The Central Helium Liquefier met its first big test when it supplied liquid helium for the successful test of the full 45 MeV injector. Ultimately it will supply 2 degrees K liquid helium to the pair of parallel, interconnected superconducting linacs (linear accelerators) comprising the 4-GeV recirculating electron beam accelerator. The plant operated for some 2100 hours in support of the Front End Test. The liquid helium transfer lines that are welded in place on the walls of the tunnel enclosure continue to be installed.

By 1995 the accelerator is expected to be operating at full energy, with a full range of capabilities, and delivering beam to the three experimental halls simultaneously.

DOE Review of Schedule and Budget

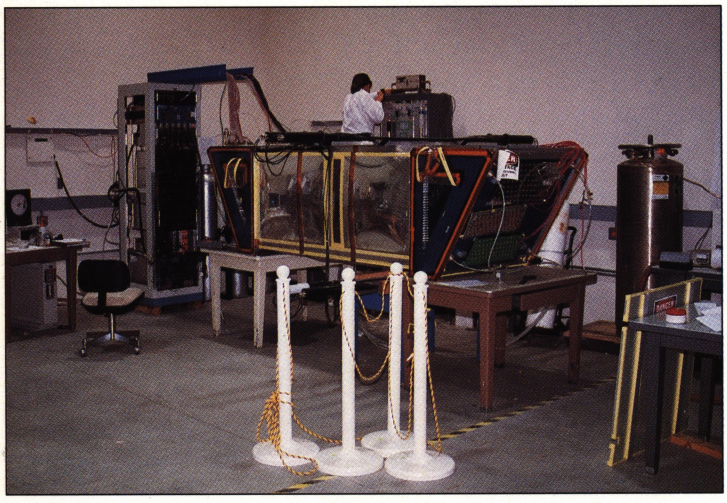
During June 1991, a committee selected by the Department of Energy's Office of Energy Research conducted another major semiannual review of CEBAF. The committee complimented CEBAF's achievements to date and found the project to be well managed with many dedicated employees led by Director Hermann Grunder. The report emphasized the need for a new budget baseline in light of new DOE guidelines.

CEBAF was facing a serious issue raised by a $20 million shortfall in funding proposed for fiscal year 1992 and needed to stay on schedule. With the addition of $12 million by Congress to CEBAF's budget for fiscal 1992, much of the delay can be avoided. The accelerator will be completed in the second quarter of fiscal year 1994 and ready to start physics research in the third quarter of fiscal year 1994. By the following year the accelerator is expected to be operating at full energy, with a full range of capabilities, and delivering beam to the three experimental halls simultaneously. The accelerator's continuous-wave electron beams will collide with detector targets, and CEBAF's experiments in nuclear physics will be under way.

Experimental Program and Technology Transfer Initiatives

Planning for the experimental program is well under way. The CEBAF Program Advisory Committee has recommended approval or conditional approval of 29 proposals from potential users. These proposals would require about 8,000 hours of beam time, or about half the beam time available during the first three years of operation. The plan calls for keeping a substantial share of available beam time uncommitted during CEBAF's early years of operation to provide the flexibility needed to pursue new research proposals and ideas.

As with most major research equipment, physicists' proof of CEBAF's ability to perform high quality work can be expected to be followed quickly by proposals to upgrade the accelerator's energy capability to accommodate new experimental areas.



Pictured is the drift chamber prototype developed for the CEBAF Large Acceptance Spectrometer (CLAS) in Hall B. This detector employs a system of parallel wires that will reconstruct, via computers, the paths of the charged particles as they pass through the chamber.

Institutions Building Special Experimental Equipment and/or Submitting Research Proposals to CEBAF

In the United States

Abilene Christian University
American University
Argonne National Laboratory
Arizona State University
Brookhaven National Laboratory
California Institute of Technology
California State University - Los Angeles
Carnegie Mellon University
Catholic University
Christopher Newport College
Duke University
Florida State University
George Mason University
George Washington University
University of Georgia
Hampton University
Harvard University
University of Houston
University of Illinois
Indiana University Cyclotron Facility
James Madison University
Kent State University
Los Alamos National Laboratory
University of Maryland
University of Massachusetts
Massachusetts Institute of Technology
University of Mississippi
National Institute of Standards and Technology
University of New Hampshire
Norfolk State University
North Carolina State University
Northwestern University
University of Pennsylvania
University of Pittsburgh
Rensselaer Polytechnic Institute
Rice University
University of Richmond
University of Rochester
Rutgers University
University of South Carolina
Stanford Linear Accelerator Center
Stanford University
Syracuse University
Temple University
University of Virginia
Virginia Polytechnic Institute and State University
Virginia State University
College of William and Mary
Yale University

Foreign

University of Basel, Switzerland
CEN Saclay, France
Chungnam National University, Korea
✗ Free University of Amsterdam, Holland
INFN Sezione Sanita, Italy
ITEP, USSR
Kharkhov Institute of Technology, USSR
Leningrad Institute of Nuclear Physics, USSR
University of Lund, Sweden
✗ NIKGEF-K, The Netherlands
University of Pisa, Italy
University of Regina, Canada
University of Saskatchewan, Canada
Tel Aviv University, Israel
Yerevan Physics Institute, USSR

(Note-SURA institutions appear in bold face)

In response to direction by the U.S. Congress and the Department of Energy to its national laboratories to contribute to technology development and transfer, CEBAF scientists reviewed technology developed at CEBAF. They found specifically that the electron beam technology developed at CEBAF could be useful to the scientific and industrial communities interested in the possibilities of developing two versatile, high-power free electron lasers (FELs) with optical output spanning the infrared and deep ultraviolet wave lengths.

The FELs would have many uses in general research and technology development. The proposed FELs would be integrally linked to the CEBAF superconducting accelerator, and operated in parallel with it, but would not interfere with operation of the accelerator for nuclear physics experiments.

In accord with this potential for advancing the state of the art of optical spectroscopy, an Industrial Advisory Board (IAB) has been formed to advise CEBAF on the scope and uses of the instruments. A draft proposal that defines the FELs' design, technical capabilities, projected opportunities, cost, manpower, and potential schedule was developed during 1991 with funding by the Virginia Center for Innovative Technology.

At its initial meeting, in August, the IAB responded enthusiastically to the proposal for the design of the FELs. CEBAF plans to bring a proposal to the SURA Board for approval in the near future.

Educational outreach has been a way of life at CEBAF since the first scientists, engineers, and technical staff moved onto the site.

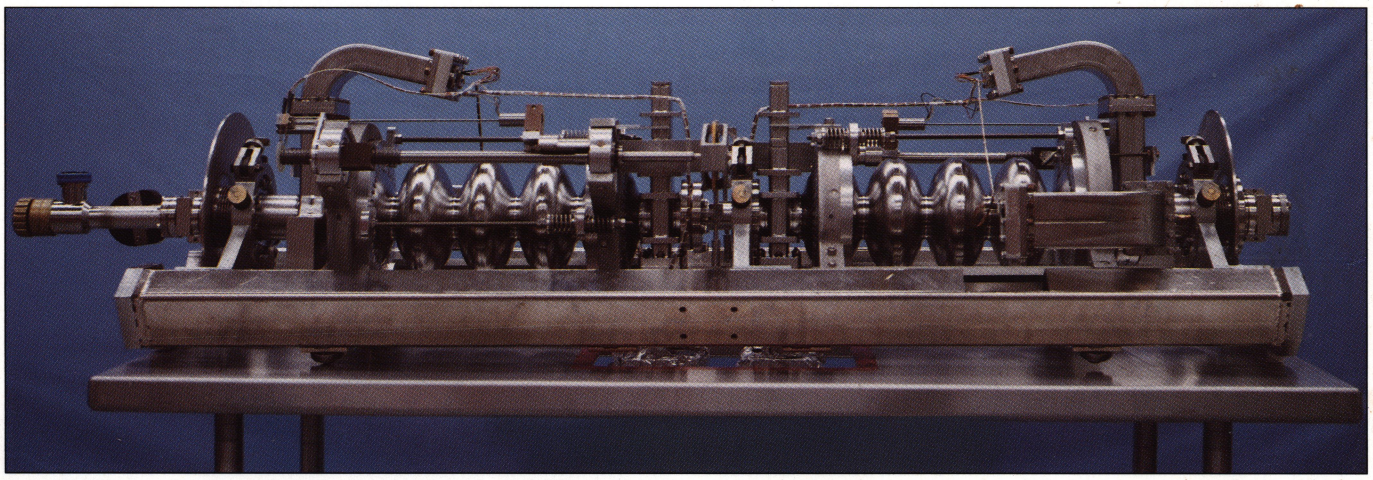
Educational Outreach

Educational outreach has been a way of life at CEBAF since the first scientists, engineers, and technical staff moved onto the site. While field trips by visitors and students to the laboratory continue, and CEBAF speakers are still in demand in the community, the educational initiatives have grown steadily more sophisticated.

Last spring, in response to the DOE initiatives to support the Presidential goal of U.S. students' being first in the world in math and science, CEBAF piloted a new approach to motivating inner-city fifth- and sixth-grade students in science and math studies. The program was tested in cooperation with Newport News public schools.

Kathy Strozak, CEBAF Science Education Coordinator, helps BEAMS students perform one of the many experiments used to explain science during their weeklong visit.

The program is called BEAMS — for Becoming Enthusiastic About Math and Science. BEAMS brings entire classes — with teachers, desks, and schoolbooks — into the lab for a full week. During their week, the students continue with their regular schoolwork, augmented with special science and math activities. These activities aim to motivate the students by exposing them to science's excitement, challenges, and opportunities; to decrease their sci-



Nowhere are the exacting demands of accelerator building better demonstrated than in the processing and assembly of cavities. The key to proper performance of cavities is rigorous purity of the niobium of which they are constructed, blemish-free fabrication, ultraclean interior surfaces, and absolute prevention of even the tiniest of leaks. After several special treatments, cavities are assembled in pairs in the filtered, dust-free air of a special room. Then the cavity pair is sealed into its cryounit, where liquid helium keeps the niobium at 2 degrees K. Each cryomodule is 27 feet long and contains four cavity pairs.

Approximately 800 students (middle school, high school, and college) visited CEBAF last summer. They toured the lab, listened to presentations, and participated in hands-on activities.

ence/math anxiety; and to stimulate their awareness of career opportunities in science and technology. With some 50 role-model volunteers from CEBAF's staff conducting these special hands-on activities, the students are immersed in the lab's culture and environment for the entire week. Schools in surrounding communities are being included this year when two classes per week will be in residence at CEBAF for 20 weeks of the academic year. An evaluation of the project to date indicates that BEAMS holds great promise for influencing upper-elementary students in constructive and lasting ways. BEAMS is a model that could be expanded to the state and national levels, with other laboratories and companies participating to help motivate the nation's students.

Meanwhile, other programs continue. Approximately 800 students (middle school, high school, and college) visited CEBAF last summer. They toured the lab, listened to presentations, and participated in hands-on activities. The students came from regional, state-funded, and National Science Foundation programs. Ten high school teachers worked at CEBAF last summer on eight-week fellowships. They spent three-fourths of their time working with staff on research projects and one-fourth developing activities for classroom use. In addition to seven local teachers, the group included teachers from Mississippi, Indiana, and Colorado. This was the second summer for the program, which began with only two teachers the first year.

Other ongoing education programs are:

- The Hampton University Graduate Studies (HUGS) program, which conducted its sixth annual six-week session. The program is designed to introduce physics graduate students to the science that will be done at CEBAF in the 1990s. Twenty-six students from universities around the world attended during the summer.
- The SURA/CEBAF Graduate Fellowship Program, offering annual awards to graduate students enrolled in SURA institutions in CEBAF-related fields of science and engineering. Awards for the 1991-92 academic year were made to six students, who also are given an opportunity to spend a summer working at CEBAF.
- The Scientific Director's Lecture Series, consisting of 20 two-hour lectures on CEBAF-related special topics in nuclear physics, presented three times a year.
- The Student Internship Program, providing employment opportunities for 160 postsecondary students.

CEBAF Population

At the end of fiscal year 1991, CEBAF employees numbered 375, which is the projected employment when the facility is fully operational. Add to that the state of Virginia, SURA, and DOE employees, temporary employees, contractors and their employees, and a continual flow of visitors, and the CEBAF on-site population on any given day numbers around 800.

SURANET

In its fifth year, SURAnet is a well established operational regional computer network providing high speed, high quality, data communications for the purposes of transmitting and sharing information and resources. The network continues to grow and to improve in service to the research and education communities of the Southeast.

YOUR WINDOW TO THE WORLD

A new brochure describing SURAnet calls it "your window to the world" because a SURAnet user can reach other institutions on the Internet throughout the world. SURAnet provides access to the National Science Foundation Network (NSFNET) and the Internet for more than 120 sites — universities, colleges, high schools, government research laboratories, and other scientific institutions — throughout the 13 southeastern states, the District of Columbia, and Puerto Rico.

SURAnet is managed by four principal investigators, Dr. Glenn Ricart at the University of Maryland, who also serves as SURA Vice-President for Network Development, Dr. Henry Schaffer at North Carolina State University, Dr. Morton Taragin at George Washington University, and Dr. F. L. Suddath at Georgia Institute of Technology. The SURAnet Project Director is Dr. Jack Hahn. SURAnet offers its users comprehensive network services — both technical and informational — from its two Network Operations Centers in College Park, Md., and Atlanta, Ga.

Phase I of SURAnet, 1986-1989, funded by the National Science Foundation (NSF), involved the establishment, development, and growth of the network. A subsequent NSF Phase II grant to SURAnet provides $3.7 million for three years, ending June 30, 1992, to advance the network and its services as provided to academic institutions. SURAnet members participate in the networking activities by contributing creativity, skills, and more than half of their operating costs. Commercial members contribute all of their operating costs.

SURANET OPERATIONS

SURAnet is a packet-switched network based on the TCP/IP (Transmission Control Protocol/Internet Protocol) suite of protocols, a widely accepted networking standard throughout the research and education community. The mesh network topology provides redundancy for improved reliability and enhanced throughput.

SURAnet operates from two Network Operations Centers (NOCs), one at College Park, Md., and one at Georgia Institute of Technology in Atlanta, Ga. The Atlanta site became a SURAnet NOC last year when an NSFNET Nodal Switching System (NSS) was installed at the location. With NSSs at both College Park and Atlanta, the SURAnet community has two access points to the NSFNET. These offer alternate and redundant pathways and result in enhanced performance and reliability. The two NOCs operate in an integrated manner providing network monitoring coverage around the clock, seven days a week.

A T1 (1.544 megabits per second) backbone connects network sites to each other and to SURAnet's two Network Operations Centers. This summer, the lines between the two NOCs and NSFNET were upgraded from T1 to T3 (45 megabits per second).

A new brochure describing SURAnet calls it "your window to the world" because a SURAnet user can reach other institutions on the Internet throughout the world.

SURAnet-generated traffic for the NSFNET ranks in the top three of the regional networks nationally. The T3 connections will enhance network use and prevent bottlenecks between SURAnet and the NSFNET for SURAnet users who access remote resources via the backbone.

Individual sites on the network can choose among 9.6 kilobits per second, 56 kilobits per second, and T1 bandwidth connections. By next year, SURAnet will also be able to offer T3 connectivity to sites that wish to connect to either of the NOCs or between specific pairs of SURAnet sites. As users' requirements for greater speed increase, the SURAnet interstate backbone will be upgraded to T3 speeds as well.

The SURAnet College Park Network Operations Center also serves as one of two national interconnection points to the Federal Interagency Exchange (FIX) networks consisting of NSFNET, DOE's Energy Sciences Network (ESnet), NASA Science Internet (NSI), and the Department of Defense's Terrestrial Wide Band Network (TWB). In addition, SURAnet has a mailbridge connection to MILnet. The other FIX is at NASA's Ames Research Center, Moffett Field, Calif. Having the FIX at College Park results in better response times, higher throughput, and more reliable service for SURAnet users who need access to these federal agency networks.

Contract with MCI

In September, SURA signed an agreement with MCI that will result in a new technological configuration for the SURAnet backbone. The change will yield improved service, greater reliability, and lower costs for SURAnet members. According to the terms of the agreement, SURAnet routers will be placed at 16 MCI points of presence. This arrangement will increase reliability and reduce communications costs, the latter primarily by eliminating a number of local loop lines.

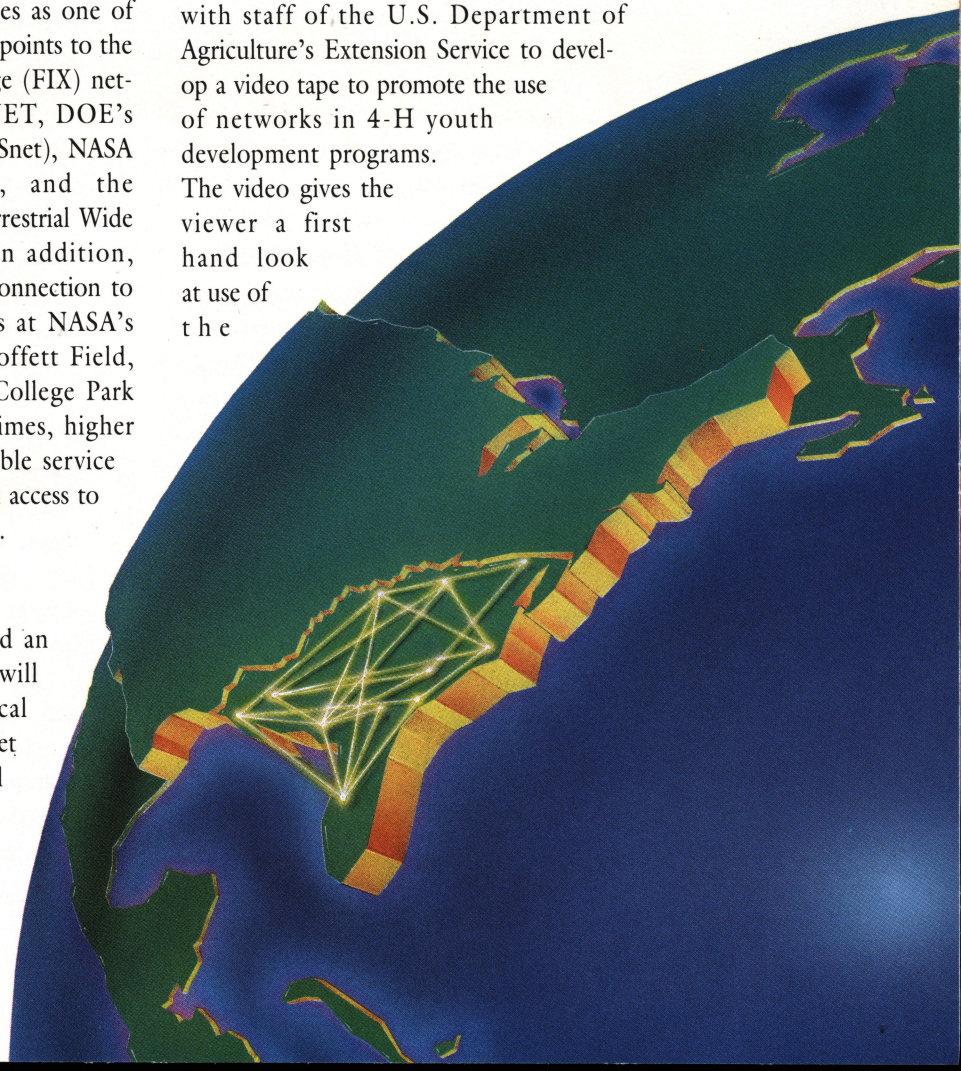
SURA also signed a separate agreement with MCI that will afford noncommercial SURAnet members an opportunity to obtain low cost, group rate long distance telephone and other services from MCI.

SURAnet-generated traffic for the NSFNET ranks in the top three of the regional networks nationally.

K-12 Networking

SURAnet is reaching out to provide network connections to elementary and secondary schools. Montgomery Blair High School, Silver Spring, Md., is already connected to SURAnet.

Last spring, SURAnet staff worked with staff of the U.S. Department of Agriculture's Extension Service to develop a video tape to promote the use of networks in 4-H youth development programs. The video gives the viewer a first hand look at use of the



In September, SURA signed an agreement with MCI that will result in a new technological configuration for the SURAnet backbone. The change will yield improved service, greater reliability, and lower costs for SURAnet members.

Internet at the high school level. The extension service and SURAnet will use the video to demonstrate the value of computer networking in grades from kindergarten through high school.

Policy Development

SURAnet held its second annual policy meeting in May 1991 in Atlanta. More than 70 representatives of SURAnet and its members attended the meeting on the campus of Georgia Tech. Among the topics discussed were SURAnet's acceptable use policy, a new pricing policy, and an MCI proposal for network services.

The new pricing policy promises somewhat lower prices for most members of SURAnet. The pricing structure reflects choices a site may make regarding aspects of service it receives such as line speeds and maintenance of equipment.

SURAnet's acceptable use policy reflects the network's primary mission as a research and education network, but also permits commercial traffic.

SURAnet Review Committee

This year, President William Wallenmeyer appointed a high-level committee, the SURA Review Committee for SURAnet, to review and assess SURAnet and its programs. The committee met in September 1991 for the first time and will continue to meet annually to advise SURA on the management, goals, procedures, operations, progress, and plans of SURAnet. The committee was favorably impressed with SURAnet and its operations and plans and gave the network high marks for its accomplishments.

Joe B. Wyatt, Chancellor of Vanderbilt University, serves as chairman of the committee. Other members are: Alison Brown, Associate Director, Ohio Supercomputer Center; Stephen C. Hall, Director of the

Network Information Center

Recognizing the importance of giving network users more access to information resources, SURAnet formally established a Network Information Center (NIC) in March 1991. The center currently has a staff of two and is headed by an experienced information scientist. The NIC is charged with delivery of extensive information support to SURAnet members and users in a variety of areas.

The NIC publishes a "Guide to Information Resources" and a quarterly newsletter, The SURAnet Connection. These tools are intended to help both new and experienced network users exploit network information resources necessary for effective research, teaching, and general network use. The guide and the newsletter are available in both print and electronic forms and demand for them has been strong.

One of the most important and promising areas of network use is scientific cooperation and collaboration. To facilitate these objectives, the NIC is working with groups of scientists to develop directories, data bases, and newsletters and to foster network-based communities of interest in general. Efforts to date have been focused on the natural sciences and mathematics. Support of scholars in the social sciences and humanities is anticipated.

In many instances, effective use of network resources is not possible until users have been informed about and trained in network protocols and resources. The NIC is active in providing training seminars and workshops aimed at creating a network-literate user population. NIC offers some of these functions alone and others in collaboration with other organizations such as Merit, Inc., the consortium that runs the Michigan Educational and Research Information Triad network. Effective network use also requires knowledge of electronic mail addresses of people on the network. To this end, the NIC is in the process of creating directories and providing information on implementing electronic directories to member institutions who wish to do likewise.

Services provided by the NIC are evolving with user needs and demands. The NIC has made a start in meeting some of the most urgent needs. In the coming year, we see an expansion of all these services as well as the introduction of new services that will be defined by the needs and involvement of the SURAnet members working with NIC personnel.

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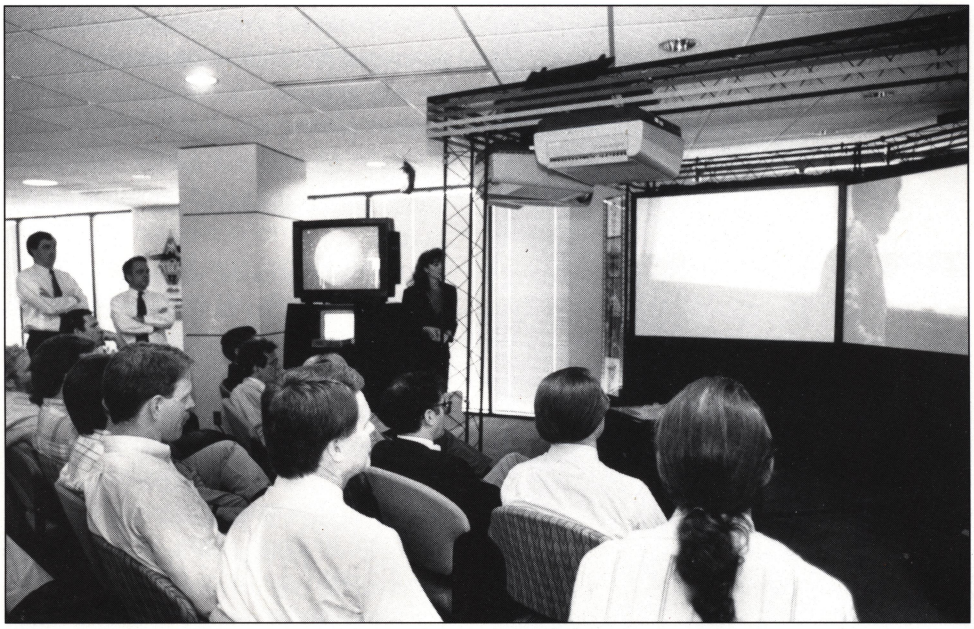


The SURAnet policy meeting in May included a live video conferencing demonstration sponsored by MCI, Digital Access Corporation, and Video Telecom. The demonstration allowed meeting attendees in Atlanta to speak with MCI representatives at the MCI office in Virginia.

Office for Information Technology, Harvard University; Ken Klingenstein, Director, Computing Network Services, University of Colorado; Ron Larsen, Associate Director for Information Technology, University Libraries, University of Maryland; and M. Stuart Lynn, Vice-President for Information Technologies, Cornell University. Frank Kyle, Deputy Director of Vanderbilt University's Computer Center, serves as Executive Secretary to the Committee.

Other Projects

Over the past year a number of special projects and activities have been explored and developed for SURA sponsorship.

Global Climate Change Research

Over the past year SURA has continued to press for federal funding of its major, multiuniversity, collaborative global change research proposal, "Interactions Between Terrestrial Biota and the Atmosphere: A Case Study for Examining Global Change at the Mesoscale."

While the SURA global climate change research proposal is focused on the southeastern geographical region, the goal is to develop integrative conceptual and empirical methods whereby climate-related change in any region can be effectively and systematically studied.

The SURA proposal outlines an integrated, interdisciplinary approach to the study of interrelationships among mesoscale climate, vegetation, and atmospheric chemistry. Some 30 senior investigators from nine universities, including seven in the Southeast, participated in development of the current proposal along with scientists from Oak Ridge National Laboratory and the U.S. Department of Agriculture. SURA member institutions now involved include the Universities of Georgia, Tennessee, and Virginia; Florida State University; Georgia Institute of Technology; and North Carolina State University.

The research plan is built around a series of models that explicitly link climate change and atmospheric chemistry with models of vegetation dynamics. A unique feature of the proposed research is the emphasis on mesoscale models and measurements. The product of this integrated, interdisciplinary research will be new, improved models and field techniques for studying mesoscale ecological processes and environments and for extrapolating from local studies to regional changes.

While the SURA proposal is focused on the Southeast, the goal is to develop integrative conceptual and empirical methods whereby climate-related change in any region can be effectively and systematically studied.

A revised proposal, submitted to several federal agencies in August 1990, was reviewed by a number of outside experts. Last April SURA was advised of the outcome of this review. Eliminating those who tended simply to question the concept of a large collaborative, interdisciplinary study, the proposal was favorably received — particularly by those who also reviewed the original proposal.

Key program officers in federal agencies, who had encouraged SURA to revise and resubmit its edited proposal, report that the reviews are not the problem in gaining funding support. The problem, rather, is the inability of agencies to get together for a fair and reasonable interagency consideration and support of such a broad, unsolicited, interdisciplinary proposal on an integrated basis. SURA is continuing to press, at higher levels of the federal government, for such fair and reasonable consideration of its proposal.

SURA owes a special debt of gratitude to Dr. Ronald Pulliam, Director of the Institute of Ecology at the University of Georgia, whose ideas were the genesis of the original concept. He led the development of the proposal and spearheaded efforts to strengthen the revised version, with the assistance of Dr. Melvin Dyer, program coordinator of the proposal. Dr. Pulliam serves as SURA Vice-President for Global Change Research. His continued leadership is critical to securing support for the proposed research and to development of collaborative efforts in climate change research among institutions in the Southeast. SURA has been planning such

additional collaborative efforts as a follow-up to its first proposal — these would involve SURA institutions that have expertise and interest in participating in complementary, interdisciplinary research.

Materials Research

This year SURA sponsored its third summer materials science research program at Oak Ridge conducted jointly with the Oak Ridge National Laboratory (ORNL), which brought university faculty and their students to work with the staff and use the facilities at ORNL. Based on the good record, experience, and success of the 1989 and 1990 summer programs, SURA submitted to the Department of Energy a proposal to support an expanded program this past summer. In response, the DOE provided $200,000 for the 1991 program. This is, significantly, the first direct federal support SURA has received for the program, and DOE has evinced interest in supporting it in subsequent years.

The summer program continues to demonstrate the effectiveness of collaboration among scientists and engineers interested in different aspects of materials research — advancing science and the training of future researchers. The program is also an important step on the way to development of the Materials Science Center at Oak Ridge being pursued by SURA.

Twenty-five responses to SURA's request for proposals for the program were reviewed for scientific importance and quality; effective collaboration with ORNL staff; effective use of ORNL facilities; and the involvement of students and value of their training. Some 14 faculty members and their 16 graduate students from nine southeastern universities participated in this year's program, working on 13 research projects in materials disciplines including semiconductors, surface science, metallurgy, neutron diffraction, and the effects of lasers on solids.

Project leadership came from a project steering committee of Thomas Hutchinson, Calcott Professor of Biomedical Engineering, University of Virginia; Sidney Perkowitz, Candler Professor of Condensed Matter Physics, Emory University; and James Roberto, Director, ORNL Solid State Division.

The SURA Council on Materials Science and Engineering, under its new chairman, William Sibley, Vice President for Academic Affairs of the University of Alabama at Birmingham, is continuing the preparation of proposals for the center concept. The membership of the council has changed somewhat since it was established two years ago. In addition to Sibley, the current members are Steven Antolovich, Georgia Tech; Harvill Eaton, Louisiana State; Richard Haglund, Vanderbilt; Craig Hartley, Florida Atlantic; John Hren, North Carolina State; Paul Huray, South Carolina; Thomas Hutchinson, Virginia; William Manly, Cabot Corporation (Retired); Sidney Perkowitz, Emory; Bill Appleton, ORNL; Jerry Draayer, Louisiana State; Robb Thomson, National Institute of Standards and Technology; and George Wheeler, Tennessee.

At a meeting of the council in July, working groups were established to develop proposals on the following: a university-industry relations and technology transfer workshop; telecommunications and a computer data base for materials research; materials research affinity or cluster groups; summer support for students and faculty; and the center facility.

Efforts are also under way to develop a directory of faculty groups in the Southeast involved in materials science and engineering. In addition to its general value, this directory will be a source of information to encourage the formation of research teams

or clusters across institutions for collaborative efforts in specific areas of materials research.

Southeastern Photon Light Source Consortium

SURA continues to serve as a facilitator in bringing together representatives of the photon light sources in the southeastern region to encourage collaboration and coordination of their plans and research efforts. In February 1991, SURA hosted the third meeting of the Southeastern Photon Light Source Consortium at CEBAF.

SURA's role in the photon light source consortium meetings is to foster communication and complementary activities among the light source groups and to help provide information about the sources' characteristics and capabilities to the SURA research community.

Faculty members representing the free electron lasers at Duke and Vanderbilt and the synchrotron light source at Louisiana State University attended, along with a number of scientists from CEBAF interested and involved in developing the laboratory's plans for a free electron laser facility. The group was also joined, for the first time, by representatives from North Carolina State University and Florida Central University who are involved in the development of new light source activities at their institutions. Presentations were given on the plans, progress, and uses of the various light source facilities.

A major step forward in the life of the consortium was the consensus reached at CEBAF that the group should formalize its existence by establishing a charter for the Southeastern Photon Light Source Consortium setting forth near-term and long-term goals. The tentative goals of the consortium set forth at the meeting are to:

- Promote the development and application of advanced beam-driven photon sources in the Southeast.
- Provide a forum for sharing technical information and manpower.
- Develop strong local user support for existing and planned facilities. Expand user support to regional and national levels.
- Encourage high-level peer review of existing and planned facilities.
- Develop a plan for submission of facility and user proposals to various funding agencies to encourage and develop coordinated support for advanced photon sources in the Southeast.

The next meeting of the consortium is scheduled at Vanderbilt University in March 1992. SURA's role in these meetings is to foster communication and complementary activities among the light source groups and to help provide information about the sources' characteristics and capabilities to the SURA research community through the *SURA Newsletter*, workshops, and other means.

Taken as a whole, these facilities will give the Southeast a strong and unique combination of light sources for studying fundamental properties of matter and for materials and medical research. It is hoped that the information provided by SURA may assist researchers in finding new research opportunities.

High Energy Physics

As a further step in advancing high energy physics — and related technology development — in the Southeast, SURA initiated and cosponsored an Atlanta Conference on the Superconducting Super Collider (SSC) in November 1990. "Industrial and Scientific Opportunities" through the SSC was the theme of the conference, held in conjunction with a meeting of the southeastern section of the American Physical Society.

The purpose of the Atlanta conference was to help illuminate the industrial and scientific opportunities associated with the SSC and to present progress and status reports on SSC scientific and technological work.

Charles Knapp, President of the

University of Georgia and Chairman of the SURA Council of Presidents, welcomed the conference participants and chaired the first session, which included talks on the SSC by John Toll, President of the Universities Research Association; Roy Schwitters, Director of the Superconducting Super Collider Laboratory; and Sandra Dunn of the Texas National Research Laboratory Commission. The dinner address was given by Congressman Tim Valentine (N.C.), Chairman of the Subcommittee on Science, Research and Technology of the U.S. House of Representatives.

William Dunn, President, Quantum Research Services, Inc., played a key role in organizing the conference. Other important leadership roles in the conference were those played by representatives from a number of SURA member institutions, including the Universities of Alabama, Maryland, South Carolina, Tennessee, and Virginia and Duke University, Florida State University, Georgia Institute of Technology, Louisiana State University, and Virginia Polytechnic Institute.

The conference had 155 registrants including attendees from not only the Southeast but also from across the United States and from Europe and Asia. Representatives from universities, industry, and federal and state agencies were present.

SURA also helps to promote high energy physics in the Southeast through its continued involvement in and contribution to the work of the Southern Association for High Energy Physics (SAHEP), specifically the SAHEP Initiative for SSC Research and Education (SISSCRE). SAHEP operates under the auspices of Oak Ridge Associated Universities (ORAU), and SURA participates with SAHEP working groups and is represented on the SAHEP Executive Board.

In response to two SISSCRE proposals, the Texas National Research Laboratory Commission (TNRLC) awarded SAHEP a one-year, $1 million contract for detector research and development associated with the Superconducting Super Collider (SSC) program. The institutions performing the R&D are: Duke, Florida, Florida State, Hampton, Jackson State, Memphis State, Mississippi, North Carolina State, Oklahoma, ORAU, Oak Ridge National Laboratory (ORNL), Quantum Research Services, South Alabama, South Carolina, Tennessee, Vanderbilt, Virginia, Virginia Polytechnic Institute, and William & Mary. Eleven of the university participants are SURA members.

The contract will primarily support R&D in six major activities: simulation studies, calorimetry, particle tracking, particle identification, radiation damage, and fast electronics. The SAHEP contract covers an initial one year period, April 1, 1991 - March 30, 1992. It is anticipated that follow-on support will be provided by TNRLC at an enhanced funding level.

Most of the SAHEP institutions involved are also part of collaborations to develop major SSC detector systems. The Solenoidal Detector Collaboration (SDC), which already has approval to proceed toward a Technical Design Report to the SSC, includes Duke, Florida, Florida State, Mississippi, ORNL, Quantum, and Virginia Polytechnic Institute. The Gamma-Electron-Muon (GEM) collaboration, which recently submitted an Expression of Intent to the SSC, includes Mississippi, Tennessee, Vanderbilt, and ORNL. In addition, the Super Fixed Target Beauty Facility Collaboration, which is progressing, includes Duke, ORNL, South Alabama, South Carolina, Virginia, and William & Mary.

SURA also helps to promote high energy physics in the Southeast through its continued involvement in and contribution to the work of the Southern Association for High Energy Physics (SAHEP).

Organization and Administration

The Southeastern Universities Research Association, now 11 years old, is well established. Building on the experience of SURA's first decade and looking forward to the next, the Board of Trustees last year established an ad hoc committee to consider long-range plans for SURA's development and activities. The committee has been working throughout the year and will report to the Board at its meeting in November 1991.

Membership

The Southeastern Universities Research Association comprised 40 colleges and universities — 38 voting and 2 associate members — at the end of fiscal year 1991. During the year, the Council of Presidents voted to add one institution, Florida Atlantic University, as a voting member of the association. Each institution with voting membership is represented by a trustee on the Board of Trustees and by the institution's president, *ex officio*, on the Council of Presidents. Associate members are represented on the Council of Presidents, but do not have representatives or votes on the Board of Trustees.

A long-range planning committee, established to recommend plans for SURA's directions and activities, will report to the Board of Trustees at its November 1991 meeting.

Governance

The Board of Trustees provides policy and management direction and oversight of the SURA organization and its projects. The corporate officers are responsible for carrying out the board's directions. The board meets twice a year and works through several standing committees and, as needed, ad hoc committees. The Executive Committee acts for the board on matters requiring action between board meetings.

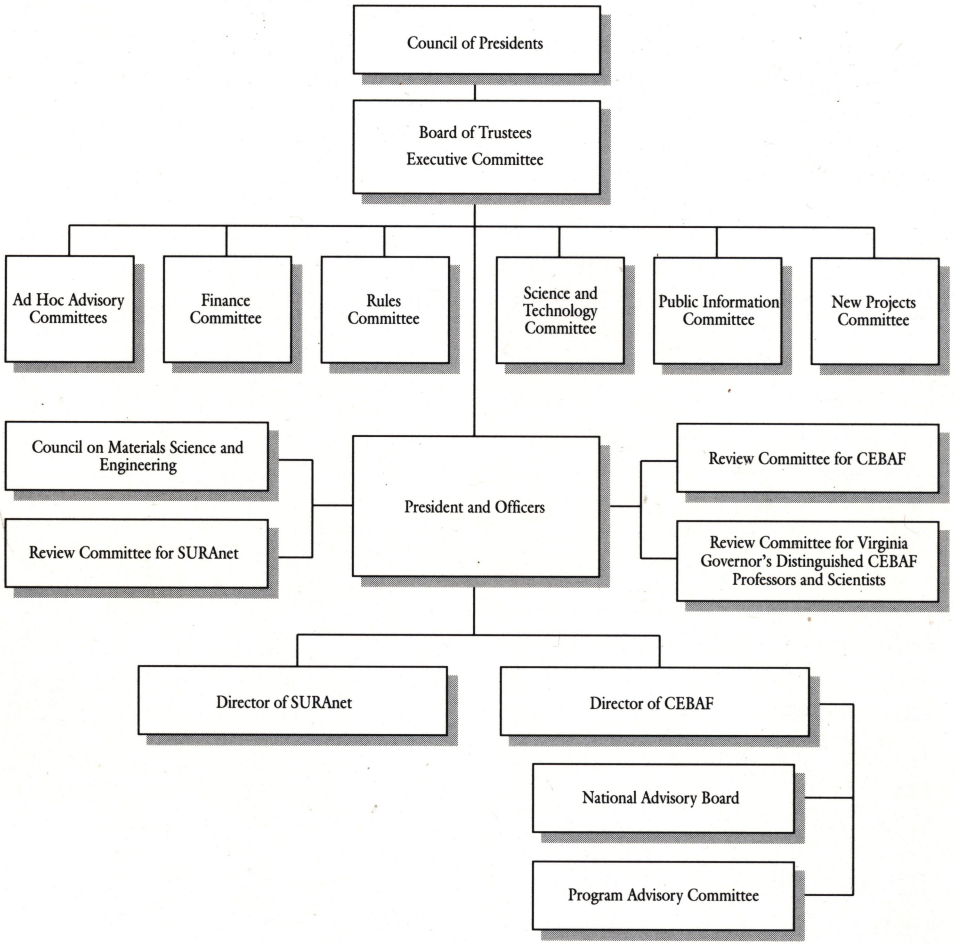
Dr. Wimberly Royster, University of Kentucky, will complete a two-year term as Chairman of the Board on December 31, 1991. The current Vice-Chairman of the Board, Dr. Thomas Clegg of the University of North Carolina, will become chairman effective January 1, 1992.

The vice-chairman's succession to chairman is the result of a recent change in the SURA bylaws intended to provide long-term continuity in leadership. The changes provide that (1) the Vice-Chairman of the Board, after being elected and serving a two-year term, shall automatically succeed to the chairmanship for a two-year term; and (2) that the immediate past-Chairman of the Board shall serve on the Executive Committee for one year after completion of his term as chairman.

The board initiated a long-range planning activity to provide direction for SURA's continued success in the coming decade. A number of topics warrant the planning committee's attention. Significant among them are recognition of SURA's potential strengths, cooperation among its member institutions, expanded resources for major regional science programs, management of existing projects, and identification and nurturing of collaborative projects worthy of future support. Members of the long-range planning committee are Thomas Clegg, who serves as chairman; Donald Robson, Florida State University; Dennis Barnes, University of Virginia; Paul Huray, University of South Carolina; Joe Key, University of Georgia; and George Wheeler, University of Tennessee.

At its meeting November 9, 1990, the Board of Trustees accepted a recommendation of the Rules and Committees Committee to institute a procedure intended to increase the participation of trustees in the Executive Committee and its work. The new procedure calls for

The Board of Trustees and its Executive Committee establish policy and oversee the SURA organization's management, which is the primary responsibility of the corporate officers.



The Board of Trustees instituted a procedure intended to increase the participation of trustees in the Executive Committee and its work. The new procedure calls for standing committee chairmen to be appointed for three-year terms and for a newly-appointed chairman to attend the Executive Committee meeting preceding his taking the chair.

standing committee chairmen to be appointed for three-year terms and for a newly-appointed chairman to attend the Executive Committee meeting preceding his taking the chair.

The Council of Presidents is responsible for general oversight of the corporation's activities and the election of new member institutions and institutional trustees. At its annual meeting, the council votes on a slate of trustees nominated from approximately one-third of its member schools to serve a three-year term. A Council Nominating Committee determines the slate of nominees from names recommended by institutional presidents. Presidents are encouraged to recommend people who will represent both the institution's and SURA's best interests and who may have a specific interest, involvement, or contribution to make to SURA's projects and activities. Each president recommends two candidates — one from the faculty and one from the administration —

for a new three-year term. From the names recommended, the nominating committee attempts to balance the membership of the Board of Trustees between administrators and faculty.

The members of the Council of Presidents, and Board of Trustees and board and corporate officers are listed in the appendix.

SURA Office and Staff

SURA President William Wallenmeyer has announced that he will retire next spring after serving in the post since October 1987. As a consequence, the Board of Trustees has directed a committee to undertake a search for the next SURA President. That committee is currently at work and is expected to recommend a candidate for president to the board by the first part of the next calendar year.

Dennis Barnes, who represents the University of Virginia on the board, has been named SURA Vice-President for CEBAF to assume responsibility for corporate matters related to CEBAF and plans are for him to serve in that position at least until a new president is in place.

Corporate headquarters for SURA is Suite 320, 1709 New York Avenue, NW, Washington, D.C. The site is one block west of the White House and convenient to federal research agencies' headquarters and the U.S. Congress. The office suite can comfortably accommodate staff and consultants as well as visitors who may need temporary access to a desk and telephone. Meetings of the Executive Committee and other modest-sized groups can be accommodated in the suite's conference room.

Dana Hamel, Executive Director of the Virginia Center for Public/Private Initiatives, Richmond, serves as SURA Vice-President with special responsibilities for liaison with state and local governments in Virginia. Robert von Hollen is Treasurer and Comptroller. Hugh Loweth serves as Corporate Secretary and Special Assistant to the President, and Geraldine Shannon is the Executive Director.

Two additional vice-presidents are named for their roles on SURA projects. Glenn Ricart serves as Vice-President and Director of Network Development, and Ronald Pulliam serves as Vice-President for Global Change Research. Ricart, Director of the University of Maryland's Computer Science Center, is a principal investigator of SURAnet. Pulliam, who is Director of the University of Georgia Institute of Ecology, is principal investigator on the SURA global change research proposal.

During the past academic year, Sidney Perkowitz, Candler Professor of Condensed Matter Physics at Emory University, served as SURA's Senior Scientist. On sabbatical leave from Emory, he devoted 60 percent of his time to SURA work, especially in the materials research area, and the remainder to his research and writing interests.

Finances

A corporate operations budget of $1,409,000 was approved by the Board of Trustees for the fiscal year 1991, ending June 30, 1991. Actual expenditures for this period were $1,289,541.

SURA and all of its operations are audited annually by a national accounting firm. Copies of the financial statements and the auditor's opinions are available for review and inspection at SURA headquarters in Washington, D.C.

The Board of Trustees has approved an initial operating budget of $1,416,000 for fiscal year 1992.

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APPENDIX

Council of Presidents and Board of Trustees

(September 1991)

Institutions	Council of Presidents	Board of Trustees
University of Alabama at Birmingham	Charles A. McCallum	William Sibley
The University of Alabama	Roger Sayers	Benjamin Harms
American University	Joseph Duffy	Keith Osterhage
Auburn University	James E. Martin	Paul F. Parks
Catholic University	William J. Byron, S.J.	Hall Crannell
Clemson University	Max Lennon	Philip B. Burt
University of Delaware	David P. Roselle	Richard B. Murray
Duke University	H. Keith H. Brodie	Edward G. Bilpuch
University of Florida	John V. Lombardi	Alex G. Smith
Florida Atlantic University	Anthony J. Catanese	Bjorn Lamborn
Florida Institute of Technology	Lynn Weaver	N. Thomas Stephens
Florida State University	Dale W. Lick	Donald Robson
George Mason University	George W. Johnson	Menos Kafatos
Georgetown University	Leo J. O'Donovan, S.J.	James Lambert
George Washington University	Stephen J. Trachtenberg	Donald Gross
Georgia Institute of Technology	John P. Crecine	Gary Poehlein
The University of Georgia	Charles B. Knapp	Joe L. Key
Hampton University	William R. Harvey	Robert D. Bonner
James Madison University	Ronald E. Carrier	Barbara Castello
University of Kentucky	Charles T. Wethington, Jr.	Wimberly C. Royster
Louisiana State University	William E. Davis	Jerry P. Draayer
University of Maryland	William Kirwan	Robert Gluckstern
Mississippi State University	Donald W. Zacharias	Ralph E. Powe
Norfolk State University	Harrison B. Wilson	Jesse C. Lewis
University of North Carolina	Paul Hardin	Thomas B. Clegg
North Carolina State University	Larry K. Monteith	Franklin D. Hart
Old Dominion University	James V. Koch	John S. Eck
University of Richmond	Richard J. Morrill	Wayne Major
University of South Carolina	John M. Palms	Paul G. Huray
University of South Florida	Francis T. Borkowski	George R. Newkome
University of Tennessee	John Quinn	George Wheeler
Vanderbilt University	Joe B. Wyatt	William T. Pinkston
University of Virginia	John Casteen	Dennis Barnes
Virginia Commonwealth University	Eugene Trani	S. Gaylen Bradley
Virginia Polytechnic Institute & State University	James D. McComas	Ernest R. Stout
Virginia State University	Wesley C. McClure	Carey Stronach
West Virginia University	Neil S. Bucklew	Richard Bajura
College of William and Mary	Paul R. Verkuil	Melvyn D. Schiavelli

Associate Members

Institutions

Christopher Newport College
Florida International University

Council of Presidents

Anthony Santoro
Modesto A. Maidique

Trustees-at-Large

Bill R. Appleton, Oak Ridge National Laboratory
Jon M. Veigel, Oak Ridge Associated Universities
Robb Thomson, National Institute of Standards and Technology
James Palmer, Newport News Shipbuilding and Drydock Company

SURA Officers and Chairmen of Standing Committees of the Board of Trustees

Council of Presidents

Chairman	Charles B. Knapp *University of Georgia*
Vice-Chairman	David P. Roselle *University of Delaware*

Board of Trustees

Chairman	Wimberly C. Royster *University of Kentucky*
Vice-Chairman	Thomas B. Clegg *University of North Carolina*
Secretary	Robert D. Bonner *Hampton University*

Corporate Officers

President	William A. Wallenmeyer
Vice-President	Dana B. Hamel
Vice-President for CEBAF	Dennis Barnes
Vice-President and Director, Network Development	Glenn Ricart
Vice-President for Global Change Research	Ronald Pulliam
Secretary	Hugh F. Loweth
Treasurer/ Comptroller	Robert von Hollen
President Emeritus	Harry D. Holmgren

Chairmen of Standing Committees of the Board of Trustees

Finance	Gary Poehlein *Georgia Institute of Technology*
Rules	Alex G. Smith *University of Florida*
Science & Technology	Robert Gluckstern *University of Maryland*
Public Information	Dennis Barnes *University of Virginia*
New Projects	Jerry Draayer *Louisiana State University*

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